

Southern Steelhead Trout	<i>Oncorhynchus mykiss</i>	FE, SSC	Hovey
<b>Invertebrates</b>			
All sensitive species in SCR			Hovey/ Marschalek

Status key: FE = Federal endangered, FT = Federal threatened, FPE = Federal proposed endangered, SE = State endangered, ST = State threatened, SSC = Species of Special Concern, FP = State fully protected.

## 2. NCCP (Fish and Game Code § 2800-2840)

NCCP plans require that monitoring programs be established to assure: 1) compliance with the requirements of the plan, 2) effectiveness of the plan in conserving the biological resources the plan proposed to conserve, and 3) information is provided to an adaptive management program. The SCR monitoring program is focused primarily on the latter two items, although the first item also plays a role in the program for certain Department lands included within the NCCP preserve system. Data are collected by all NCCP plan participants on NCCP preserve lands under their jurisdiction to assess the overall effectiveness of the NCCP plan. The SCR Monitoring Team monitors Department Ecological Reserves and Wildlife Areas within NCCP planning areas to assess biological condition, management needs, and management effectiveness on those lands.

## 3. Coordination and Collaboration

The SCR Monitoring Team coordinates with a number of other agencies, universities and non-profit groups in the course of its monitoring activities. In some cases Monitoring Team personnel engage in joint field monitoring efforts (e.g., red-legged frog surveys with U.S. Geological Survey (USGS)), while in other cases the team oversees contracted monitoring or research work carried out by one of our partners. In addition, the Monitoring Team works closely with the U. S. Fish and Wildlife Service (USFWS), USGS – Biological Resources Division, and local jurisdictions to develop regional monitoring plans under the NCCP program. Other partners in 2002 include: San Diego State University, U.S. Forest Service, Bureau of Land Management, Conservation Biology Institute, San Diego Natural History Museum, Wildlife Research Institute, San Diego Tracking Team, Institute for Wildlife Studies, and Point Reyes Bird Observatory.

## II. SPECIES

Species listed as rare, threatened, or endangered under state and/or federal law, and those taxa considered to be Species of Special Concern or included on the California Native Plant Society's Inventory of Rare and Endangered Plants in California, are given highest priority for monitoring, research and management by the SCR. Highlights from the SCR monitoring program for select species are summarized below.

A. **Pacific Pocket Mouse**  
(*Perognathus longimembris pacificus*)

**Size:** The Pacific pocket mouse (PPM) is one of 19 recognized subspecies of little pocket mouse, and the smallest member of the family Heteromyidae (up to 131 millimeters nose to tip of tail length, and 7 to 9 grams in weight; *Recovery Plan for the Pacific Pocket Mouse*, 1998, USFWS).

**Status:** The PPM was emergency listed as endangered by the USFWS in 1993, and finally listed as federally endangered on September 29, 1994. The PPM is also listed as a State Species of Special Concern.

**Monitoring methods:** Sherman live traps.

**Biological Information:** The PPM is endemic to coastal southern California from the Marina del Rey/El Segundo area of Los Angeles County, south to the Mexican border. Based upon historic records, this subspecies has always been patchily distributed throughout its range. The PPM inhabits sandy substrates in open shrub lands or disturbed areas along the immediate coast. Its food preferences include primarily the seeds and stems of grasses and forbs, both native and exotic, with occasional consumption of arthropods and/or insect larva.

With the progression of intense coastal development in southern California, this animal has suffered significant habitat loss and degradation. Currently, there are only four known population centers remaining: Dana Point Headland in Orange County, and three sites on the Camp Pendleton Marine Corps Base, San Diego County (San Mateo-South, San Mateo-North, and the Oscar-1 training area). Of the four occupied sites, the Oscar-1 site supports most of the remaining individuals. Between 1993 and 1997 fewer than 150 individuals were captured during trapping surveys at all sites.

Since 1997, the SCR has contracted with various researchers, in consultation with the USFWS and other experts, to conduct an array of studies to aid in the recovery of this species. To date, studies have focused on assessment of various permanent marking techniques, surveys of the Dana Point Headlands, habitat manipulation (i.e., vegetation thinning) at Dana Point Headlands to enhance habitat, the genetic relationship between the different PPM populations, survey of the species' historic range, surveys for new populations and possible translocation sites, and a study of PPM soils preference and soil status of potential translocation sites. Reports on the completed research projects are available from the SCR. The current SCR PPM contract is focusing on analyzing the soils of three occupied sites along with soils from six to seven potential receiver sites in Orange and San Diego Counties. The PPM prefers fine sandy soils, and potential receiver sites were picked in part for the apparent presence of suitable soils. The current study is an attempt to quantitatively compare occupied sites with these receiver sites to

see whether the initial field assessments were correct. This analysis will be used to further refine the receiver site selection. This study will be completed in 2003.

Of recent concern has been the drought conditions prevailing in southern California over the past several years, with 2002 being the driest year on record. Recent surveys of certain populations have shown a significant decline in numbers. In particular, in August 2002, a SCR monitoring team biologist assisted with a USFWS-sponsored intensive trapping effort at the Dana Point Headlands site. After nine days of trapping, only two individuals were trapped. In 1993, initial surveys of the Dana Point Headlands resulted in the capture of 25-36 individuals. The reduced numbers of animals in 2002 also occurred on the Camp Pendleton site Oscar-1 (USFWS, personal communication). Follow-up surveys are expected to be conducted in 2003 to monitor the status of the populations. It is hoped that improved rainfall in 2003 will allow for some recovery of the populations.

**Remarks/Recommendations:** As a part of the NCCP Implementing Agreement for the Central-Coastal Orange County NCCP Plan, the SCR is involved in directing federal Endangered Species Act (Section 6) funds to study the PPM, and specifically to assess the feasibility of translocating this animal. Part of the NCCP Plan agreement calls for the possible removal of PPM from the Dana Point Headlands site. The current owner of this property is also contributing funds for research and conservation of this species.

The SCR will continue to direct Section 6 funding toward recovery projects for the PPM, with guidance from the PPM Technical Advisory Committee. Funding will likely include continued population monitoring at the known PPM sites. In addition, there is a need to use individually marked PPM to assess the structure of the PPM populations, as well as reproductive success, recruitment, dispersal, and survivorship. The low numbers of individuals trapped in recent years has hindered collection of these types of data. It is hoped that improved rainfall conditions in 2002-2003 will help the populations to recover to the point where population demographic data is more easily collected.

SCR has entered into one MOU to conduct research on PPM (Dodd).

**B. Island Fox**  
*(Urocyon littoralis)*

**Status:** State Threatened (1971) (all islands); Federal Proposed Endangered (2001) (San Miguel, Santa Rosa, Santa Cruz and Santa Catalina Islands only).

**SCR Monitoring and Conservation Program Highlights in 2002:** SCR was a successful competitor for federal Endangered Species Act Section 6 "Candidate Conservation Agreement" funding for the island fox on Catalina Island and Santa Cruz Island. These funds became available at the end of 2002. Contracts to

complete the Candidate Conservation Agreement for the island Fox will begin in 2003. A comprehensive progress report will be included in the SCR annual report for 2003.

**Remarks/Recommendations:** At the close of 2002, SCR had issued four MOUs for research, monitoring, and/or management of the island Fox (Institute for Wildlife Studies (Garcelon), Roemer, Willett, U.C. Davis (Van Vuren)). The Island Fox Working Group meets annually in June; SCR biologists routinely participate with this group.

**C. Light-footed Clapper Rail**  
**(*Rallus longirostris levipes*)**

**Status:** State Endangered (1971) and Federal Endangered (1970) Species; Fully Protected (FGC § 3511). Federal Recovery Plan (final 1979).

**SCR Monitoring and Conservation Program Highlights in 2002:** SCR was a successful competitor for federal Endangered Species Act (Section 6) funding for the light-footed clapper rail monitoring, protection, and nest platform refurbishment project. These funds became available at the end of 2002.

**Monitoring methods:** Clapper rails are typically monitored by two methods—spring call counts and winter high tide counts. A description of the two methods follows:

Spring call counts: Conducted from March through early May. Early morning (dawn until two hours after sunrise) and late evening (two hours before dark until dark) are the prescribed survey time periods. No surveys are conducted during periods of inclement weather. Where light-footed clapper rails are common, all locations of spontaneous calls may be mapped. In those marshes with few rails or in long, narrow channels and habitat strips, the judicious use of tape-playback is allowed to solicit a response from territorial rails. Duets and “clappering” calls are treated as indications of territoriality. Note that the use of tape-playback of clapper rail vocalizations requires a MOU from the Department.

High tide counts (winter): Observers are stationed around the perimeter of the marsh to detect rails as they move to the drier uplands as the tide rises. Canoes and kayaks may also be used to position observers throughout the marsh. Observations of rails are recorded and mapped.

**Biological Information:** Light-footed clapper rails have been the subject of an annual census since 1980, largely through the efforts of Richard Zembal and the USFWS. A census was conducted in 2002. Observers detected 274 pairs of clapper rails in 16 marshes, rangewide. This total suggests the population may be increasing following a series of poor years (1998-222 pairs, 1999-233 pairs, 2001-217 pairs). Upper Newport Bay Ecological Reserve is the stronghold for this

subspecies of rail; 129 pairs or 47% of the total population occur here. Tijuana Marsh NWR is second with 78 pairs (28%) while Seal Beach is a distant third with 24 pairs (9%). Of note, just these three marshes support 84% of the total light-footed clapper rail population. Contracts to conduct field surveys at all key rail marshes as well as provide predator management services at Kendall-Frost marsh have been prioritized for action in 2003. A comprehensive statewide survey report will be prepared under contract in 2003.

**Remarks/Recommendations:** At the close of 2002, SCR had issued two MOUs for research and/or monitoring of the light-footed clapper rail (Zemba and Sweetwater Authority; note Konecny was issued an MOU in early 2003).

**D. Western Snowy Plover**  
(*Charadrius alexandrinus nivosus*)

**Status:** Federal Threatened (1993) Species; Species of Special Concern. Federal Recovery Plan (draft 2001).

**SCR Monitoring and Conservation Program Highlights in 2002:** SCR monitored Western snowy plover populations on the following Department-managed breeding locations in southern California: Ormond Beach (Ventura County), Bolsa Chica (Orange County), and Batiquitos Lagoon (San Diego County). SCR managed one contract to provide monitoring of snowy plovers at Ormond Beach (Wehtje Biological Services) and supervised one scientific aid to monitor snowy plovers at Bolsa Chica; Batiquitos Lagoon was monitored under a contract managed by the Reserve Manager.

**Remarks/Recommendations:** At the close of 2002, SCR had issued four MOUs for research and/or monitoring of the Western snowy plover (Collins, Copper, Patton, Zemba).

A Southern California Western Snowy Plover working group was formed in early 2003 to act as a clearinghouse for information for this species. This working group is facilitated by the USFWS and meets twice, annually; SCR monitoring biologists are regular participants. Data on population size and range will be presented, compiled and distributed through the USFWS.

**E. California Least Tern**  
(*Sterna antillarum browni*)

**Status:** State Endangered (1971) and Federal Endangered (1970); Fully Protected (FGC § 3511). Federal Recovery Plan (final 1980).

**SCR Monitoring and Conservation Program Highlights in 2002:** SCR continued its comprehensive conservation program for the California least tern,

focusing on coordination/administration, research, management and monitoring activities in 2002.

Coordination/Administration: SCR successfully secured federal Endangered Species Act (Section 6) funding for 2005. Statewide least tern conservation coordination was provided for the third consecutive year through a contract with Robert Patton to compile data and prepare annual report. Weekly updates on the status of least terns and Western snowy plovers were sent to an interagency, consultant e-mail group. Two statewide annual coordination meetings (February and November) were facilitated. The statewide annual report for 2000 was reviewed, edited and prepared for publication.

Research: At the close of 2002, SCR had issued five Memoranda of Understanding (MOUs) for research and/or monitoring of the least tern (Baird, Collins, Copper, Keane, Patton). A study on food habits/reproductive success of the least tern was initiated in conjunction with Marine Region. SCR supervised one scientific aid who assisted monitors at Batiquitos Lagoon (San Diego County), three scientific aids who monitor least tern sites in Mission Bay (San Diego County) and Bolsa Chica (Orange County) and assisted the Reserve Manager to provide remote monitoring of the tern colony at Upper Newport Bay (Orange County) using volunteers. Contracts were let to provide monitoring of least terns at Venice Beach (Los Angeles County) (Keane Biological Services) and Ormond Beach (Ventura County) (Wehtje Biological Services).

Management: Two scientific aids were hired to provide predator management services in Los Angeles and Orange Counties. Predator management services were provided under contract at Batiquitos Lagoon and FAA Island, Mission Bay (San Diego County). Nesting sites were prepared at Batiquitos Lagoon, FAA Island, and Venice Beach by removing vegetation, replacing and/or repairing chick fence, incorporating interpretive signage. The Reserve Manager and volunteers removed all vegetation from Upper Newport Bay nesting islands. SCR continued efforts to enlarge the Venice tern preserve by securing all permits, including California Coastal Commission and coordinating and soliciting support for the project from neighborhood and homeowner groups in area.

Monitoring Methods: Monitoring data from each of the 30 least tern colonies in the state are collected annually and compiled by a monitoring coordinator under contract with SCR. The following data on monitoring efforts are collected at each site: dates of the first and last monitoring visits, the number of visits during the season, whether individual nests are marked (as with tongue depressors), whether individual eggs are marked (such as with numbers on shell in permanent ink), whether chicks are banded. Biological data are collected in the following categories: estimation of breeding pairs (based on number of nests, less the number of re-nests), productivity (total number of nests, number of eggs, number of chicks hatched, number of chicks reaching fledgling age, number of fledglings surviving to disperse). Mortality and predation data are also collected.

**Biological Information:** The California least tern experienced an unproductive year in 2002, virtually statewide. A minimum total of 3511 nesting pairs of terns was counted during the survey period. This represents a 25% decline from 2001. Further, a minimum total of 442 fledglings was counted, representing an 82% decline from 2001. Although the exact cause of the reproductive failure is unknown, monitors noted a lack of availability of appropriately-sized forage fish for the chicks, at least in the southern California colonies. Numerous observations of chick starvation were reported. Several of the colonies failed following predation events. The comprehensive annual report for the 2002 least tern breeding season will be available for distribution by late 2003.

**Remarks/Recommendations :**

The California Least Tern Breeding Survey 2000 Season by Robert Patton (Species Conservation and Recovery Program Report 2002-03) was published during 2002. It is available upon request.

SCR monitoring team biologists will continue to provide a statewide conservation and recovery program for the least tern in 2003, at a level of funding and effort as for previous years. Section 6 funding has been fairly consistently available to the least tern project through the years with SCR providing the state match for these funds.

**F. Western Gull-billed Tern**  
(*Sterna nilotica vanrossemi*)

**Status:** Species of Special Concern, Highest Priority.

**SCR Monitoring and Conservation Program Highlights in 2002:** SCR Monitoring Team biologists contracted with Kathy Molina in 2002 to conduct a study on the foraging behavior and diet of breeding Western gull-billed terns on San Diego Bay. Funding for the study was made available through a federal Partnerships for Wildlife Act grant and the Rare and Endangered Species Preservation Fund (Tax Check-off). The final report was published through the Department's Species Conservation and Recovery Program in mid-2003.

Although breeding colonies of gull-billed terns have been monitored for a number of years, little information is available on the diet of the *vanrossemi* subspecies, apart from casual observations. Gull-billed terns were reported to have taken eggs and young of the endangered California least tern and the threatened Western snowy plover. A need to better understand the feeding habits of this sensitive species and its potential impacts to listed species prompted this study.

**Biological Information:** The following account is excerpted from the draft report entitled "Foraging Behavior and Diet of Breeding Western Gull-billed Terns (*Sterna nilotica vanrossemi*) in San Diego Bay, California" by Kathy

Molina and Dan Marschalek (January 2003). Breeding Western gull-billed terns are confined to only two locations in California: Salton Sea and San Diego Bay. The global distribution includes adjacent Baja California and the coast of Sinaloa and Sonora, Mexico. The global population of this subspecies is estimated at 700 pairs (Molina 2001). In recent years, the San Diego Bay population of gull-billed terns has numbered as many as 30 pairs.

Focal surveys were conducted from April 29 through July 26, 2002. Seven viewing stations were established in three sectors of the bay, all located in areas with known foraging areas for gull-billed terns and nesting least terns. Observations were made of all gull-billed tern activity, habitat use, and foraging events within two-minute intervals, following a pre-established protocol.

Gull-billed terns foraged over a variety of substrates including ocean intertidal, upper beaches, dunes, scrub and upland areas and along exposed estuarine mudflats. The terns foraged singly or in small loose groups; modal group size was one adult and median group size ranged from one to three birds. The diet of the gull-billed tern consisted of several classes of vertebrates and two classes of invertebrates. The diversity of prey items was similar to that reported for gull-billed terns elsewhere in their range. Main food items in decreasing order of frequency included mole crabs, small fish, lizards, and small chicks. Chicks comprised 3% of all observed captures and included killdeer (*Charadrius vociferous*), black-necked stilt (*Himantopus mexicanus*) and snowy plover.

**Remarks/Recommendations:** Plans to continue the study for a second year were frustrated when the federal Partnerships for Wildlife Act grant program was discontinued. Biologists from the USFWS, private ornithologists, as well as Mexican biologists plan to conduct a rangewide assessment of the status of the *vanrossemi* subspecies of gull-billed tern in 2003. In the meantime, gull-billed terns will continue to be protected on the breeding grounds in San Diego in 2003. Diet information, including documentation of predation on least tern and snowy plover chicks, will be collected by biologists working under contract with the USFWS. Gull-billed tern coordination meetings, facilitated by the USFWS, are held annually, usually in February. Future management options will be discussed in that forum.

At the close of 2002, SCR had issued two MOUs for research and/or monitoring of the gull-billed tern (Copper, Patton).

**G. Belding's Savannah Sparrow**  
(*Passerculus sandwichensis beldingi*)

**Status:** State Endangered (1974).

**SCR Monitoring and Conservation Program Highlights for 2002:** Statewide Belding's Savannah sparrow surveys are conducted at five year intervals. A

statewide survey was conducted in 2001 under contract through the SCR with funding through SCR and the Rare and Endangered Species Preservation fund (Tax Check-off). Richard Zembal was the principal investigator for the 2001 survey; SCR biologists assisted with field assessments. The final report entitled "A Survey of the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*) in California, 2001" by Richard Zembal and Susan M. Hoffman (Species Conservation and Recovery Program Report No. 2002-01) was published in June 2002 and is available upon request. Results are summarized below.

**Monitoring Methods:** Belding's Savannah sparrow breeding bird surveys were conducted from March 18 through May 30, 2001. The optimal period to conduct breeding bird surveys is March-April. Counts were completed from sunrise up to four hours later. If overcast or other conditions led to prolonged morning activity, occasionally the surveys continued into the later morning hours.

Observers detected breeding behavior and other territorial cues through observation of singing, scolding, extended perching together of mates, nest building, feeding young, aerial chases, and prolonged posting under certain circumstances. Aerial chases that were straight line indicated a single territory, with the chased bird leaving the area. Circular chases indicated two neighboring territories. Regularly spaced individuals that were perched high and fully exposed in the *Salicornia* were all counted as territory holders.

**Biological Information:** Belding's Savannah sparrows exhibiting breeding behavior were detected in 30 of 32 marshes surveyed in the spring of 2001. They were recorded at Goleta Slough, Santa Barbara County, south to the Tijuana Slough National Wildlife Refuge at the Mexican border. A minimum total of 2,902 pairs was detected. This is the highest state total reported since the periodic counts began in 1973 and is 23.5% higher than the next highest count, reported in 1996. The most significant increase was noted at Point Mugu which accounted for 27.8% of the total sparrow population in 2001. Major restoration of the Mugu lagoon ecosystem has brought considerable acreage under tidal influence, resulting in excellent sparrow nesting habitat. Eight marshes held more than 100 pairs each, totaling 2,154 pairs or 74.2% of the population. These critically important marshes are Mugu Lagoon, Seal Beach, Bolsa Chica, Upper Newport Bay, Santa Margarita River Estuary, Los Penasquitos Lagoon, Salt Works, and Tijuana Marsh.

**Remarks/Recommendations:** At the close of 2002, SCR had issued two research and/or monitoring MOUs for the Belding's Savannah sparrow (Copper, Zembal).

In 2003, SCR biologists will perform spot surveys related to project implementation and impact assessments and make management recommendations for the conservation of the species. The next statewide survey is scheduled for 2006.

**H. Western Pond Turtle**  
(*Clemmys marmorata*)

**Status:** Species of Special Concern.

**SCR Monitoring and Conservation Highlights in 2002:** Western pond turtles (WPT) are quite often encountered during stream surveys for other species. During the 2002 sampling year WPT's were observed in San Juan Creek, San Mateo Creek, Devils Canyon Creek and San Onofre. Turtles that are captured during surveys are measured (carapace length) and sexed. SCR monitors also check for any carapace marking that may have been made by other biologists.

While specimens have been observed co-existing with exotic fish species and may even prey on those species, WPT's seem to thrive in areas void of exotic animals. However, if exotic turtle species are present (red-eared sliders, box turtles) WPT are usually out-competed by these species.

**I. California Red-legged Frog**  
(*Rana aurora*)

**Status:** Federal threatened (1996).

**SCR Monitoring and Conservation Highlights in 2002:** The only population of California red-legged frogs (CRLF) that was routinely sampled was in San Francisquito Creek, in northern Los Angeles County. This population was sampled four times during the 2002 season. A total of eight adults, all submerged, were observed during two night surveys. Individuals were observed on the creek bottom and were easily approached. Two frogs, a male and female, were photographed in amplexis.

Several egg masses were also observed during night surveys. Eggs were attached to submerge vegetation and located less than a foot from the shoreline. All egg masses were located on the north shoreline of the creek and approximately five-to-seven inches in diameter. Bright tape was used to mark vegetation near the eggs so they could be easily identified in the future. Several egg masses were discovered that had either dropped (already hatched) or were non-viable.

A single male was observed calling and was approached during the last night of the survey. The calling sequence enabled us to also locate a large female, presumably the frog being called to. We observed these two frogs in the hopes of witnessing amplexis, but unfortunately the male swam off.

**Monitoring Methods:** Frogs were observed during night surveys using halogen lights and head lamps. No adults were handled only approached. Metamorphs and tadpoles were collected and observed using small beach seines and hand nets. All animals were returned back to the pools after observation.

**Biological Information:** Tadpoles were collected and observed during two daytime surveys conducted during the 2002 season. Individual animals were being examined for chytrid fungus, a pathogenic fungus which attacks keratin, a tough, fibrous protein that serves as a protective and resistant layer in animal skin. When frogs become infected by chytrid, this protective layer can become damaged. Since the tooth rows and jaw sheaths of tadpoles are also composed of keratin, the fungus can have a localized effect on these mouth parts. While infected tadpoles aren't killed at this stage, they usually succumb during metamorphosis. No chytrid was found during the 2002 surveys.

During one of the survey trips, a single tadpole was injured during collection, which resulted in its loss. This incident was quickly reported to USFWS as required by the MOU between the USFWS and the Department. Sampling protocol will be adjusted to avoid this type of take in the future.

During the summer of 2002 a large fire went through the upper drainage and exposed previously unknown CRLF habitat. Subsequent surveys revealed additional healthy populations, with little or no exotic fish presence. Population surveys of CRLF in San Francisquito Creek are ongoing.

**J. Mountain Yellow-legged Frog**  
(*Rana muscosa*)

**Status:** Federal Endangered (1999).

**SCR Monitoring and Conservation Highlights in 2002:** A large-scale effort, involving several Department Regions was conducted in Little Rock Creek in the San Bernadino Mountains, San Bernardino County in October of 2002. A small population of mountain yellow-legged frogs (MYLF) occupies a stretch of Little Rock Creek. Within a stretch of creek that contains MYLF is a fish barrier that precludes upstream movement of trout. Roughly 1.5 miles further down stream is another barrier. The 1.5 miles of creek between the two fish barriers is occupied by nonnative trout.

In October several volunteers and biologists from USGS and the Department conducted three stream surveys to remove as many trout as possible in that reach.

**Monitoring Methods:** Several methods were employed during the three day fish removal effort. Gillnetting was attempted in the upper portion of the stream and backpack electro-shocking was the method used throughout most of the removal reach. Over the three day period it became clear that the most effective method for completely removing trout was the electro-shocker. A large number of trout, representing several age classes, were successfully removed.

**Biological Information:** Currently the number of MYLF's that occupy the Little Rock Creek drainage is small, no more than seven adults. It is hoped that

continued trout removal in the lower stretch will allow for downstream migration of MYLF's. The plan is to continue trout removal once a year for a period of three years. With the DFG approved stocking restriction here and the trout removal, the hopes are that the small MYLF population will expand downstream. This project is ongoing.

**K. Arroyo Toad**  
(*Bufo californicus*)

**Status:** Federally Endangered (1995).

**SCR Monitoring and Conservation Highlights in 2002:** The 2002 sampling period was extremely poor for arroyo toad observations. Attempts were made to survey for toads at Boden Canyon, near the Santa Ysabel road crossing and upstream of the main pond, as well as Marron Valley and San Pasqual Valley. Two surveys were conducted, one in April and one in May of 2002 on the Boden property. During the April survey, a total of five arroyo toads were observed and measured. These were yearling individuals, of a single size class and probably not reproductively mature.

Additional surveys were conducted in the Boden Canyon area without success. Lack of water in some of the prime breeding habitat is likely the reason for the low numbers of toads observed. Temperature fluctuations also played a significant role in toad presence. During all surveys, temperatures were far below what would be considered optimum for toad movement.

The sandy habitat above the main pond on the Boden Canyon ER appears to be quality habitat, with the lack of seasonal water being the only quality habitat component absent. Previous annual surveys in this area have yielded a small population of animals, with varying size classes represented.

Marron Valley and San Pasqual Valley were both sampled once during the 2002 season and no toads were observed. Again, toads have been observed at both these locations in the past and the lack of water during this dry sample year was undoubtedly the reason none were observed.

**Monitoring Methods:** A high probability of encountering arroyo toads occurs when conducting evening surveys during the breeding season. However, animals can be observed during the day preceding or immediately following the breeding season, but not in large numbers. The highest rate of success can be obtained by surveying quality habitat, near wetted areas, from March to June during the evening. Breeding males will call to females, usually with little regard for approaching lights. The number of males can be enumerated by identifying calling sights and listening for calls. Females are frequently observed at the edges of these calling areas, in the process of choosing a mate. Pairs of male and female

toads in amplexus can be observed during the breeding season, often accompanied by numerous egg strings.

Following the peak of the breeding season, return surveys can be made to the same breeding areas to assess reproductive success of the previous season. Tadpoles, and later metamorphs, or “toadlets” can be frequently encountered in these areas. Once the “toadlets” leave the water, they may not be encountered for over a year.

**Remarks:** SCR issued one research and monitoring MOU for the arroyo toad (Haas).

**L. Southern Steelhead Trout**  
(*Oncorhynchus mykiss*)

**Status:** Federal Endangered (1997).

**SCR Monitoring and Conservation Highlights in 2002:** Continued surveys were conducted on San Mateo Creek and Devils Canyon Creek, a tributary to San Mateo in northern San Diego County during the 2002 survey season. It was established that adult trout had been absent from San Mateo Creek proper since August of 2000 due to a combination of low water conditions and resource competition with exotic fish and amphibian species. Department surveys continued to monitor the presence of maturing, second-generation adults in the Devils Canyon confluence. However, drought conditions on the drainage proved too harsh for continued survival and the season ended with the collection of a single dead, adult female trout from Devils Canyon in June of 2002. While a single adult was observed in a small, holdover pool in June, no additional fish were documented in the latter part of the year.

**Monitoring Methods:** A total of four different monitoring methods were used to detect, not only steelhead trout, but native fish in general. These methods are back-pack electro-fishing, beach seining, snorkel surveys and passive observation. Back-pack electro-fishing is generally used to remove exotic fish species and was not utilized as a sampling tool when trout presence was expected. Beach seines were used to remove exotic fish species, and also to detect trout presence. The most utilized method for identifying trout presence, repeatedly documenting trout health, and fish identification was snorkel surveys. Passive observation was instrumental in documenting spawning behavior in trout.

**Biological Information:** The drought conditions during 2002 severely hampered trout survival. In the spring, a total of ten fish were routinely observed in Devils Canyon. Beginning in the summer, those numbers began to drop and holdover pools that had sustained trout up until that time began to disappear due to evaporation. The two last known individuals were observed in June of 2002. The dead fish collected in June of 2002 was a 273 mm female with no internal or

external parasites. Ten percent of her body weight was made of gonadal tissue and the eggs looked to be partially hydrated in life. This egg stage suggests that this fish may have participated in spawning activity, had the conditions improved. Four independent readers aged the fish at 2+ years of age at the time of collection.

The Devils Canyon fish represent the final chapter in the San Mateo Creek steelhead trout discovery. With no measurable amount of rain to aid them in their emigration out of the system, most of the second-generation trout most likely ended their lives as resident trout in Devils Canyon. A portion of the original, first-generation trout hopefully made it out to the ocean during the 1999 emigration discovery. The remaining fish became stranded in ephemeral pools where they had to compete for resources with exotic fish species and endure high temperatures and drought conditions.

**Remarks/Recommendations:** It is likely that additional southern steelhead migrations into San Mateo Creek have occurred in the past 50 years without detection. It cannot be understated, however, that this recent immigration was a unique event and that the information collected may serve to better understand the species in the southern portion of its range. The fact that San Mateo Creek remains one of the last un-dammed stream systems, combined with its location on mostly federal property, bodes well for future steelhead migrations provided that conditions are suitable.

**M. Tidewater Goby**  
(*Eucyclogobius newberryi*)

**Status:** Federal Endangered (1994).

**SCR Monitoring and Conservation Highlights in 2002:** Presence/absence surveys were conducted once in the San Mateo Creek lagoon in the spring of 2002. Water conditions were poor and no tidewater gobies were observed. Continued surveys will be conducted during the 2003 season, as conditions will hopefully be more favorable.

**Monitoring Methods:** Tidewater gobies are collected using large and small beach seines.

**Biological Information:** The habitat of the tidewater goby is confined to shallow brackish portions of coastal streams, marshes, lagoons and estuaries between the Smith River to the north and Agua Hedionda to the south. They feed primarily on benthic invertebrates such as ostracods, amphipods and insect larvae. Spawning can occur year-round, with spring and fall peaks. The female will lay between 300-500 eggs, which the male cares for in a mucus-lined burrow. The embryos hatch out in about ten days. Mortality appears to increase after spawning and fish typically live only a few years (Swift).

**Remarks/Recommendations:** Surveys will be conducted in coordination with USGS and Marine Base Camp Pendleton biologists. San Mateo Creek lagoon is one of nine occupied, critical habitat creeks for the tidewater goby.

**N. Unarmored Threespine Stickleback**  
(*Gasterosteus aculeatus williamsoni*)

**Status:** Federal Endangered (1970).

**SCR Monitoring and Conservation Highlights in 2002:** San Francisquito Creek is located in northern Los Angeles County and is occupied by the unarmored threespine stickleback (Federal endangered), the California red-legged frog (Federal threatened) and the arroyo chub (State species of special concern). During the 2002 season a total of four surveys were conducted on the drainage. These surveys focused on exotic removal, native fish health and specimen collection for non-native, aquatic parasites.

San Francisquito Creek is currently occupied by the exotic fish species such as green sunfish, gambusia, carp and goldfish, as well as swamp crayfish. A majority of these species are obviously aquarium releases, and were found to transmit internal and external parasites to native fish. Specimens were collected in coordination with USGS and the Center for Inland Waters, [Biology Department - San Diego State University (SDSU)].

**Monitoring Methods:** Fish were collected using beach seines and back pack electro-fishing equipment. Several areas were repeatedly seined. Collected fish were counted and measured and examined for parasites. Exotic fish were routinely collected live and transported back to SDSU for analysis. When native fish were observed with external parasites, they were also transported live to SDSU for analysis.

**Biological Information:** The population of stickleback within San Francisquito Creek was observed to be represented by several age classes and appeared to be healthy. On two survey occasions, individuals were observed with visible external parasites. These specimens were determined to be in poor health and we concluded that they would not survive. The specimens were transported to San Diego State University for analysis. The parasites were identified as Asian tapeworm (*Bothricephalus* spp.) and white spot disease (*Ichthiophthirius* sp.), also known in the culture circles as Ichth, and anchor-worm (*Lernaea* sp.) These parasites were most likely introduced into the system via exotic fish release.

Currently, sections of San Francisquito Creek are free of these parasites and it has been observed that infestation seems to be tied to water temperature, which is closely associated with seasonality. Monitoring of this system is ongoing.

**O. Arroyo Chub**  
(*Gila orcutti*)

**Status:** State Species of Special Concern.

**SCR Monitoring and Conservation Highlights in 2002:** Several populations of arroyo chub are routinely surveyed during exotic fish removal and standard surveys. Several waterways which are occupied by arroyo chub are regularly evaluated for exotic presence. These streams include San Juan Creek, upper and lower Rainbow Creek, San Francisquito Creek and Bell Canyon Creek. The San Juan Creek population represents some of the largest individuals. However, this stream also possesses several aquatic exotic species. In fact, it has been observed that arroyo chub appear to be able to co-occur with exotics regularly. This does not mean that negative impacts are not present. The San Francisquito population of arroyo chub is regularly infested with external parasites introduced through exotic release.

**Monitoring Methods:** Fish were collected using beach seines and back pack electro-fishing equipment. Several areas were repeatedly seined, the fish were counted and measured and visually examined for parasites. Fish that were found to be infected were collected and sent to SDSU. Un-infected fish were released back into the creek after data collection.

**Biological Information:** The arroyo chub has been shown to physiologically adapt to survive hypoxic water conditions and wide temperature fluctuations common in south coast streams. A majority of the individuals observed during the 2002 season were seen in relatively cool, clean water, with adequate to good dissolved oxygen content.

**P. Other Species**

SCR issued and is tracking research and monitoring MOUs for the following other sensitive species: Black Skimmer (two issued), Elegant Tern (two issued), Summer Tanager (one issued); California Horned Lark (two issued); California Gnatcatcher (two issued), Southwestern Willow Flycatcher (one issued), Least Bell's Vireo (one issued), Santa Catalina Island Shrew (one issued in early 2003), Channel Island Spotted Skunk (two issued).

**III. NCCP PLANS/REGIONAL CONSERVATION PLANS**

The SCR was the region selected for the original NCCP "pilot program" plans focused on regional conservation of the coastal sage scrub ecosystem. As the plans have progressed, the conservation vision has broadened for all of these plans to encompass a wide array of additional habitats and species. There are a number of NCCP plans, or components of plans known as "subarea plans", that are completed or under development within San Diego, Orange and Los Angeles Counties. The SCR Habitat Conservation Planning staff